

Sustainable ports in the Baltic Sea Region, Lübeck - DE

1. Policy Objective & Theme

- ADAPTATION TO RISK: Integrating coherent strategies covering the risk-dimension (prevention to response) into planning and investment
- SUSTAINABLE USE OF RESOURCES: Preserving coastal environment (its functioning and integrity) to share space
- SUSTAINABLE USE OF RESOURCES: Sound use of resources and promotion of less resource intensive processes/products
- SUSTAINABLE ECONOMIC GROWTH: Developing Europe's regional seas sustainably
- SUSTAINABLE ECONOMIC GROWTH: Balancing economic, social, cultural development whilst enhancing environment

2. Key Approaches

- Integration
- Knowledge-based
- Technical

3. Experiences that can be exchanged

The results from Lübeck about a new shore-to-ship system can be used for other ports close to urban settlement areas or tourist places, where ship emissions, noise, and vibrations reduce quality of life and environment.

4. Overview of the case

In Lübeck shipping is the most significant source for air pollution and poses a high impact on tourism in the neighbouring spa, Travemünde. Shore-to-ship electricity is therefore an efficient means to reduce air pollution. The potential effects of a shore-to-ship connection have been evaluated with model calculations for the prediction of air pollutant levels considering Lübeck-Travemünde as an example. Additionally, the use of higher quality fuel would reduce emissions of ships that are not power-plugged.

5. Context and Objectives

a) Context

Sea transport is increasing and trade is growing in the Baltic Sea Region. Increased maritime traffic potentially influence local air quality, noise, waste generation, and water pollution thus increasing pressures on the environment. However, the Baltic Sea is classified as a Particularly Sensitive Sea Area (PSSA) by the International Maritime Organization (IMO), requiring action to prevent sea pollution. The EU and the Helsinki Commission (HELCOM) regulate environmental issues in connection with shipping in the Baltic Sea. Port cities have to consider the needs of ports and shipping on the one hand and the city's living environment on the other. In the case of Lübeck, shipping emissions contribute significantly to air pollution which affects tourism in the nearby spa Travemünde. Shipping traffic will increase after new port facility constructions are fully functional.

The reduction of ship emissions, and the handling and treatment of wastewater from ships were defined as serious targets to be tackled. Ships run mainly on diesel engines, the largest engines and therefore, emissions are produced by oil tankers and bulk carriers. Ships are more efficient fuel users than large trucks based on the mass transported. However, they emit 5-26 times more SO_x than road traffic per mass transported. Therefore, shipping is a significant source for global sulphur pollution. Other significant pollutants are NO_x, particulate matter, hydrocarbons, and CO_x. Shore-to-ship power reduces the level of air

pollution, noise, and vibrations otherwise caused by running ship engines in ports. In Stockholm, such a system has been used since 1987 by ferries in liner traffic. Other ports use systems aimed at certain types of vessels such as high speed catamarans in Kolding and Helsinki. Additionally, the use of higher quality fuel would reduce emissions of ships that are not power-plugged.

b) Objectives

In the port of Lübeck, a new flexible and highly automated system for shore-to-ship power was analysed within this study. Environmental, socio-economical, and territorial impacts, information on national, European and international legal frameworks, and best practices data were compiled and analysed. These data formed the basis for the development of shared strategies, policy options, and joint commitment for implementation. Dissemination of results and further interaction among stakeholders and policy-makers should ensure a continuous impact of the work. From January – June 2004 the pilot technical solution for the shore-to-ship system was developed. In 2005 the study results were published.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

Stadtwerke Lübeck GmbH, the Hanseatic City of Lübeck, and the Baltic Energy Forum e.V. co-ordinated the study.

b) ICZM tools

The feasibility of a new technology for ship-to-shore electricity were studied. Recommendations state the conditions and circumstances under which the system may work for other ports. For the whole feasibility study literature, internet and questionnaires were used as data sources. A Memorandum of Understanding on joint policies was signed by the partners and included a guideline with recommendations and examples of good practice for policies and planning based on a feasibility study. The overall recommendations were:

- Introduction of economic incentives and co-operation between ports in developing them.
- Introduction of shore-to-ship electricity wherever possible.
- Harmonisation and improvement of waste collection and management in ports.
- Encouragement to discharge sewage ashore to prevent discharges on the open sea.
- The active promotion of environmentally sustainable best practices (promoting the sustainable development as a competitive advantage and co-operation with the stakeholders)
- Gaining the knowledge about the ambient environment for harmonisation of the environmental management of the ports in the Baltic Sea region.

7. Cost and resources

The budget for the case is not known but it was co-funded by EU ERDF funds..

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The feasibility study identified the current possibilities to reduce emissions and waste related problems rather quickly and the means to implement recommendations in policies and planning. The newly developed shore-to-ship system is highly automated and can be installed within minutes, and adjusted to different electrical grids. Cost efficiency is a major factor for usability. It is recommended for other ports where emissions and noise pose conflicts but cost efficiency, technical feasibility, and environmental effects have to be evaluated. The benefit is larger when non-fossil fuels power the ship from shore. Long berthing time, high energy demands of the ship, and frequent port calls make the system attractive. Standardisation of electrical ship grids would facilitate the application and thus the dissemination of shore-to-ship systems. The utilization of cleaner high quality ship fuel would improve the emission situation in ports further.

9. Success and Fail factors

The High grade of automation and low maintenance effort increases the applicability of the system. An Agenda 21 project had been estimating the benefits of a shore-to-ship power system for Lübeck beforehand. The co-operation with other Baltic Sea region seaports that concentrated on other ship emission and waste topics strengthened the regional Baltic Sea Agenda 21 process and led to the Memorandum of Understanding on Sustainable Port and Maritime Policy in the Baltic Sea Region. An estimated increase in sea traffic and its threats to the tourism economy increased the pressure to find a solution for reducing ship emissions. The energy production situation in Lübeck was favourable. Variable ship grids reduce the efficiency.

10. Unforeseen outcomes

Other seaports in the Baltic and North Sea, e.g. Hamburg, and in other sea regions show growing interest in the concept of shore-to-ship-power. Follow-up projects to reduce ship emissions such as Magalog or Green Ferries are studying the feasibility of liquid natural gas as an environmentally friendly ship fuel.

11. Prepared by

Priv.-Doz. Dr. habil. Gerald Schernewski & Dr. Susanna Knotz, Leibniz Institute for Baltic Sea Research


12. Verified by

Jörg Sträussler, Baltic Sea Energy Forum e.V.

13. Sources

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